

## PATENT SPECIFICATION

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## COMPLETE SPECIFICATION

**Improvements in and relating to Methods of Boiling or Preparing Foods and Beverages and to Methods for the Treatment of Water to be Used in the Preparation of Foods and Beverages**

(Communications from abroad by HYDRO-GROECK-GESELLSCHAFT M.B.H., of Joachimsthaler Str. 1 Berlin-Charlottenburg, Germany, a German Company).

5 I, CECIL EDWARD EVERY-CLAYTON, of 51/52, Chancery Lane, London, W.C.2, a British Subject, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to methods of cooking or preparing foods and beverages.

10 It has long been known that foods such as vegetables, potatoes and meat and beverages such as tea, coffee and beer are detrimentally affected during manufacture or preparation by the water in which they are boiled or with which they are prepared owing to important or palatable constituents being washed out in the water. Soft water, that is to say water poor in salts, and more especially water which is free from salts, namely rain-  
25 water, snow-water and distilled water, have particularly disadvantageous effects. However, water which is naturally hard usually becomes soft when boiled because the hardness is generally due to carbonates of the alkaline earth metals which are deposited in the boiling vessels in the form of scale when the water is heated. Therefore, in addition to the detrimental effect produced on the boiled material the lime which is necessary for the animal  
35 organism is separated from the water in which the food is boiled or with which it is prepared with the result that diseases due to lack of lime such as rickets may be caused.

40 These serious disadvantages can be obviated if the foods and beverages are prepared with a water which remains hard even when boiled. The present invention provides methods whereby such waters, which are naturally rare, can be made in a simple manner either from water which is rich in lime or chalk but deposits these substances when boiled or  
45 also from waters which are poor in or even free from lime or chalk.

According to the invention, the object

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of which in its fundamental form is to retain the lime which is naturally present in the water but separates out when the water is boiled, the material to be boiled or the water in which it is boiled or with which it is prepared is treated with alkali bisulphate, preferably sodium bisulphate, which is added in quantity such that the water is not acidified.

The alkali bisulphate can easily be added in regulated quantity, since it can be used in tablet form. The amount of the bisulphate added is adapted to suit the quantity of calcium and magnesium bicarbonate present in the water in order that no over-acidity may occur.

When sodium bisulphate is added, the calcium and magnesium bicarbonates present in the water are converted into sulphates which are appreciably or readily soluble even in boiling water and, at the same time, a corresponding amount of sodium ions is introduced into the water. The sodium ions are conducive to health and also improve the taste. Further the sulphate ions added also maintain the sulphur content of the food which is utilised by the body together with the sulphate ions for breaking down albuminous materials.

In the case of waters which are poor in lime and magnesia the maintenance of their natural hardness is not sufficient to satisfy the requirements which must be met by a water which is to be conducive to health. A further development of the invention provides a method of manufacturing, from waters of this kind and even from distilled water, waters of any desired degree of hardness.

Owing to the slight solubility of calcium sulphate it is not possible to harden water by the addition of this salt. If, however, calcium carbonate is added in an equivalent amount simultaneously with the alkali bisulphate, in particular sodium bisulphate, then considerable amounts of calcium in the form of calcium sulphate are brought into clear solution when the water is boiled.

In order to avoid over-acidification a small excess of calcium carbonate should

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be added. This small excess remains behind as an insoluble but practically inappreciable residue. If a small portion of the calcium carbonate is replaced by magnesium carbonate, which is considerably more soluble than the former, then the whole of the calcium carbonate is converted and the excess magnesium carbonate goes into solution by itself. There is then obtained a completely clear and neutral water which, by reason of its content of magnesia, is very similar to natural waters.

The use of sodium bisulphate alone or in conjunction with the said carbonate gives rise to difficulty owing to the hygroscopic nature of the bisulphate, as the salts easily cake together and premature decomposition may occur. This difficulty can be obviated by the addition of further neutral, soluble, non-hygroscopic salts. For this purpose anhydrous sodium, magnesium or ammonium sulphate, or a corresponding nitrate or phosphate, or a combination of two or more of these substances may be used.

In addition to being conducive to health the new process also effects an improvement in the taste and aroma of the foods and beverages. The natural colours of the foods, in particular of vegetables, are retained. Owing to the food, for example coffee beans, being utilized to greater advantage the process is economical.

The use of the additional substance is very simple since it need only be added to the water or to the material to be boiled before being heated, or it may be added to the hot water used for making hot beverages either during or after heating. It added after heating, it should be added to the water in the heating vessel. The lime which has separated them redissolves. There is some difficulty however in using bisulphate alone, because the quantity to be added depends on the hardness of the water. For the ordinary consumer the following method of determining the amount of the addition to be made will be sufficient. A measured quantity of water, for example 1 litre, is treated with a measured quantity of a suitable indicator, for

example bromo-phenol blue and then one tablet after another of the alkali bisulphate is dissolved in the water until a change of colour, for example from blue-violet to yellow-green, occurs. In daily use one tablet less will be employed for the same amount of water than was necessary for effecting the change in colour and over-acidification of the water will thereby be avoided with certainty.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A method of boiling or preparing foods and beverages according to which the material to be boiled or the water in which it is boiled or with which it is prepared is treated with an alkali bisulphate, preferably sodium bisulphate, the said bisulphate being added in quantity such that the water is not acidified.

2. A method in accordance with Claim 1, wherein calcium carbonate is also added.

3. A method in accordance with Claims 1 and 2, wherein the calcium carbonate is partially replaced by magnesium carbonate.

4. A method in accordance with Claim 1, wherein a neutral non-hygroscopic soluble salt, preferably sodium, magnesium or ammonium sulphate, or a corresponding nitrate or phosphate, or a combination of two or more of these substances is also added.

5. A method according to any preceding Claim, in which the amount of the substance to be added is determined by a test by adding measured quantities of the substance to be added to a measured quantity of water containing a suitable indicator.

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